

CLAIM AMENDMENTS

1. (Currently Amended) A nozzle for atomizing and spraying liquid comprising:
a longitudinal liquid flow passageway that terminates in a liquid orifice for directing a stream of liquid along a predetermined axis;

a plurality of intersecting, transverse passageways extending perpendicular to and intersecting the predetermined axis, each of the transverse passageways terminating at either end in an outlet, the transverse passageways defining a first impingement surface downstream of the liquid orifice for breaking up a stream of liquid impinging thereon into a laterally spreading dispersion which disperses through the transverse passageways, wherein the longitudinal liquid flow passageway includes a portion having a reduced cross-sectional area relative to the remainder of the longitudinal liquid flow passageway, the reduced cross-sectional area portion being arranged at a downstream end of the longitudinal liquid flow passageway for enhancing the velocity of a liquid flowing therethrough and having a cross-sectional area less than the cross-sectional area of each of the transverse passageways;

an air annulus arranged in surrounding relation to the outlets of the transverse passageways and oriented to discharge air in a downstream direction so as to strike the fluid dispersed through the outlets of the transverse passageways; and

an expansion chamber arranged downstream of the transverse passageways and air annulus, the expansion chamber communicating with a nozzle discharge orifice.

2. The nozzle according to claim 1 further including an impingement element disposed in the expansion chamber, the impingement element defining an impingement surface downstream of the transverse passageways and the air annulus.

3. The nozzle according to claim 2 wherein the expansion chamber communicates with a plurality of discharge orifices that are arranged circumferentially about the impingement element.

4. (Canceled) The nozzle according to claim 1 wherein the longitudinal liquid flow passageway includes a portion having a reduced cross-sectional area relative to the remainder of the longitudinal liquid flow passageway, the reduced cross-sectional area portion being arranged at a downstream end of the longitudinal liquid flow passageway for enhancing the velocity of a liquid flowing therethrough.

5. (Canceled) The nozzle according to claim 4 wherein the reduced cross-sectional area portion of the longitudinal fluid flow passage way has a cross-sectional area less than the cross-sectional area of each of the transverse passageways.

6. The nozzle according to claim 1 wherein the air annulus includes an inlet portion that flares inwardly in the downstream direction to enhance the velocity of air flowing therethrough.

7. (New) A nozzle for atomizing and spraying liquid comprising:
a nozzle body including:

- a longitudinal liquid flow passageway that terminates in a liquid orifice for directing a stream of liquid along a predetermined axis;

- a plurality of intersecting, transverse passageways extending perpendicular to and intersecting the predetermined axis, each of the transverse passageways terminating at either end in an outlet, the transverse passageways defining a first impingement surface downstream of the liquid orifice for breaking up a stream of liquid impinging thereon into a laterally spreading dispersion which disperses through the transverse passageways;

- a plurality of air inlet passages;

- an air guide defining an inwardly flared, radiused air annulus for channeling pressurized air from the air inlet passages to create a high velocity annular air curtain directed in surrounding relation to the outlets of the transverse passageways so as to strike the fluid dispersed through the outlets of the transverse passageways; and

- an expansion chamber arranged downstream of the transverse passageways and air annulus, the expansion chamber communicating with a nozzle discharge orifice.

8. (New) The nozzle according to claim 7 further including an impingement element disposed in the expansion chamber, the impingement element defining an impingement surface downstream of the transverse passageways and the air annulus.

9. (New) The nozzle according to claim 8 wherein the expansion chamber communicates with a plurality of discharge orifices that are arranged circumferentially about the impingement element.

10. (New) The nozzle according to claim 7 wherein the longitudinal liquid flow passageway includes a portion having a reduced cross-sectional area relative to the remainder of the longitudinal liquid flow passageway, the reduced cross-sectional area portion being arranged at a downstream end of the longitudinal liquid flow passageway for enhancing the velocity of a liquid flowing therethrough.

11. (New) The nozzle according to claim 10 wherein the reduced cross-sectional area portion of the longitudinal fluid flow passage way has a cross-sectional area less than the cross-sectional area of each of the transverse passageways.

12. (New) A nozzle for atomizing and spraying liquid comprising:
a nozzle body including:

- a longitudinal liquid flow passageway that terminates in a liquid orifice for directing a stream of liquid along a predetermined axis;

- a plurality of intersecting, transverse passageways extending perpendicular to and intersecting the predetermined axis, each of the transverse passageways terminating at either end in an outlet, the transverse passageways defining a first impingement surface downstream of the liquid orifice for breaking up a stream of liquid impinging thereon into a laterally spreading dispersion which disperses through the transverse passageways, wherein the longitudinal liquid flow passageway includes a portion having a reduced cross-sectional area relative to the remainder of the longitudinal liquid flow passageway, the reduced cross-sectional area portion being arranged at a downstream end of the longitudinal liquid flow passageway for enhancing the velocity of a liquid flowing therethrough and having a cross-sectional area less than the cross-sectional area of each of the transverse passageways;

- an air guide defining an air annulus arranged in surrounding relation to the outlets of the transverse passageways and oriented to discharge air in a downstream direction so as to strike the fluid dispersed through the outlets of the transverse passageways,; and

- an expansion chamber arranged downstream of the transverse passageways and air annulus, the expansion chamber communicating with a nozzle discharge orifice.

13. (New) The nozzle according to claim 12 further including an impingement element disposed in the expansion chamber, the impingement element defining an impingement surface downstream of the transverse passageways and the air annulus.

14. (New) The nozzle according to claim 12 wherein the expansion chamber communicates with a plurality of discharge orifices that are arranged circumferentially about the impingement element.